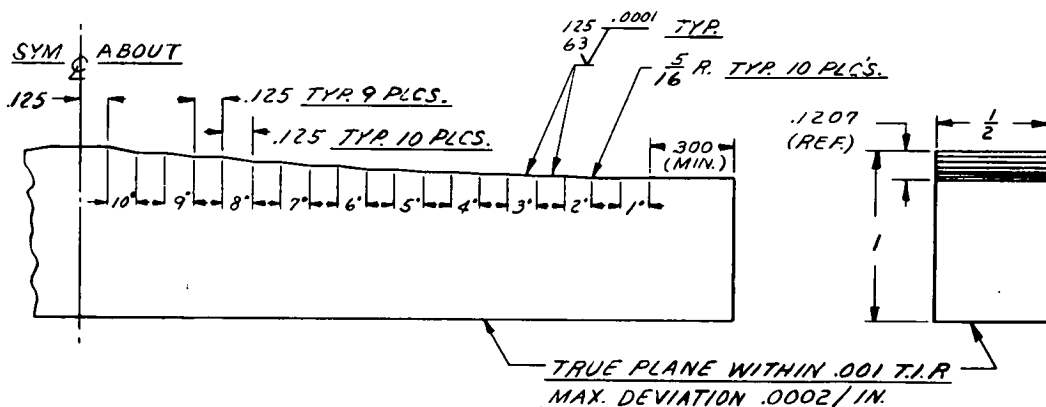


NASA TECH BRIEF



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Calibration Standard for Dynamic Evaluation of a Profile-Plotter



NOTES.

1. HORIZONTAL SURFACES PARALLEL TO BASE WITHIN .0005 T.I.R.
2. ANGLES OF SLOPES TO BE ETCHED ON FACE OF STANDARD
3. SURFACE TEXTURE, 63 - 125 AA, BASE & CONTOUR ONLY
4. REMOVE BURRS
5. TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTIONS $\pm \frac{1}{16}$
.XXX ± 0.005
ANGLES $\pm 0^\circ - 15'$

101 ALUMINUM 6061-T6
 $\frac{1}{2} \times 1 \times 6$ 1 REQD.

Details of fabrication of the standard

The problem:

Development of a method of dynamic calibration of a profile-plotter, or "Profigraph," used in conjunction with a commercial X-Y recorder for determination of the quality of highly stressed weldments. Initial trials of the Profigraph disclosed that, while successive chart traces of the same profile path were almost identical when taken in the same direction, they were markedly different when the direction of traverse of

the stylus was reversed. The built-in micrometer did not serve for evaluation/calibration while the stylus was moving.

The solution:

A standard has been developed for coping with dynamic evaluation (figure and table). A template is used for evaluation of the dynamic characteristics and accuracy of the plotter; it has a profile composed of surfaces parallel to and at known distances from

(continued overleaf)

a reference plane, the diverse surfaces being connected by slopes of known angles and blended (or "faired") by cylindrical developments of known radii.

How it's done:

The Profigraph is evaluated dynamically by making traces of the standard profile and subsequent interpretation of the traced values in terms of the tabulated calibration values of the standard. The uncertainty value, resulting from at least three traces of the standard, includes the systematic and random errors inherent in the complete system (in motion); when applied to the Profigraph's output data, it supplies the information necessary for attainment of the requisite level of confidence. Thus the standard has contributed to reliability of the overall program.

Tabulated Calibration Values of the Standard

Test							
No. 1				No. 2			
Side-2 Center		Side-1 Center		Side-2 Center		Side-1 Center	
A	.0000 +.0004	A	.0000 +.0005	A	.0000 +.0003	A	.0000 +.0003
B	+.0021 +.0023	B	+.0022 +.0023	B	+.0021 +.0022	B	+.0021 +.0022
C	+.0067 +.0068	C	+.0065 +.0066	C	+.0065 +.0067	C	+.0064 +.0065
D	+.0129 +.0130	D	+.0129 +.0130	D	+.0128 +.0129	D	+.0128 +.0129
E	+.0217 +.0216	E	+.0224 +.0223	E	+.0216 +.0217	E	+.0223 +.0224
F	+.0325 +.0326	F	+.0332 +.0332	F	+.0325 +.0326	F	+.0332 +.0331
G	+.0452 +.0454	G	+.0457 +.0458	G	+.0453 +.0454	G	+.0458 +.0459
H	+.0604 +.0605	H	+.0603 +.0604	H	+.0604 +.0604	H	+.0603 +.0604
I	+.0775 +.0776	I	+.0776 +.0777	I	+.0777 +.0775	I	+.0777 +.0778
J	+.0970 +.0974	J	+.0974 +.0975	J	+.0971 +.0973	J	+.0975 +.0976
K	+.1180 +.1182	K	+.1180 +.1181	K	+.1181 +.1182	K	+.1181 +.1183

Notes:

1. The innovation may interest makers of highly stressed weldments, and designers of instruments.
2. No further documentation is available. Inquiries may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B69-10458

Patent status:

No patent action is contemplated by NASA.

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